

Advances in Social Sciences Research Journal – Vol.7, No.10**Publication Date:** January 25, 2021**DOI:**10.14738/assrj.81.9579.

Tomassoni, R., Treglia, E., Pantanella, R. Q., & lungu, M. A. (2021). Creativity, Divergent Thinking, Attitudes, Values, Ideational Behaviour and Personality In A Sample Of Italian University Student. *Advances in Social Sciences Research Journal*, 7(10) 198- 208.

Creativity, Divergent Thinking, Attitudes, Values, Ideational Behaviour and Personality In A Sample Of Italian University Student.

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ABSTRACT

In order to understand how creativity can be developed, it is necessary a multi-dimensional approach that take into consideration the different factors that influence the creative behavior. Aim of this work is to analyze some psychological and personal variables in association with creative performance. The sample involved is composed of 1069 students attending the University of Cassino and Southern Lazio. The research has predicted the online administration of 4 types of self-report questionnaires that are part of the Runco Creativity Assessment Battery (rCAB): Divergent Thinking, DT 3Figures, Ideational Balance of Behavior, Attitudes and Values, How you would describe yourself. The data collected was inserted into the matrix and statistically analyzed through the SPSS program.

Key Words: creativity, divergent thinking, values, attitudes, personality

INTRODUCTION

In their review of research into Creativity, Sternberg and Lubart [1] revealed that numerous approaches to the topic present a one-dimensional character, choosing to focus on one aspect and ignore others. This tendency to isolate singular dimensions has had a distorting effect on the research data, so, alongside various other authors [2] [3] [4][5] [6] [7] [8], Sternberg and Lubart [1] recommend a multi-dimensional approach to the study of Creativity, a model that explains that creativity must include internal variables of the individual (related to intelligence, knowledge, thinking styles, personality characteristics) and contextual variables that facilitate or prevent the expression of creativity. To understand how Creativity can be developed, it is necessary, in fact, in advance, to understand which factors (cognitive, social, emotional, cultural) determine it and influence its expression and how these factors interact amongst themselves during creative performance. The data present in the literature highlights how creative expression is greatly conditioned by personal characteristics [9] [10] [11][12][13][14] [15] [16][17][18][19] [20][21],

as well as by environmental factors [22][23][24] [25][26]. Some studies show that creativity can be associated with permissive educational methods, which encourage autonomy through help, support, emotional support, rewards, contributing towards the development of divergent skills, unlike an authoritarian and directive education that could extinguish creativity at birth[27][28][29]. Parental figures that provide a rich environment for their children can influence the development of the brain's nervous structure leading to the strengthening of certain capabilities unlike others, reared in poorer conditions, who will have a greater chance of having impoverished cognitive skills. Even being a first born child can lead to being more creative, seeing as they are stimulated more both verbally and physically, also experimenting the role of leader when interacting with their younger siblings. Aptitude for creativity also depends on the cultural and social environment [30] into which the individual is inserted, this environment should provide: a certain availability of cultural means for all citizens, without disparity and differentiation of any kind; a certain level of tolerance for divergent points of view; of a recognized priority to becoming, not just of being; distribution of rewards and incentives. Therefore, if the environment does not offer certain social and cultural opportunities and conditions which enable and facilitate creativity, numerous individuals, even if gifted, will never develop such skills [31] [32]. If we take into consideration, instead, particular personal characteristics, some studies argue that, for example, it is easier to be creative being intelligent, although very intelligent people do not actually always appear very creative [4]; to be creative one must also possess other qualities such as talent, ingenuity, skill, inclination, tenacity, curiosity, original, imagination, a way of thinking that is fluid, flexible and elaborative, motivation, spontaneity and fantasy [33] [34]. The scientific approach to the assessment of creative thinking is based on an operational definition of the construct designed by Guilford [35]. Although the author acknowledges the importance of various cognitive processes, such as memory, comprehension, knowledge, assessment, etc., he argues that the main feature of creative thinking is the ability to do so in a different, original way, i.e., divergent thinking. To this author, divergent thinking implies fluency in terms of ideas (the number of ideas an individual poses for the solution of a problem or matter); mental flexibility (the number of angles from which they tackle a problem); the originality of the ideas (how infrequent they are); and the elaborateness (the number of unnecessary details used to convey the idea). Finally, many studies have investigated the personality traits that characterize the creative person, outlining a profile on which there is a certain degree of agreement among researchers [36][16][7][37]. From this study emerge that the common characteristics of creative people, be they painters, scientists or writers, tend to be nonconformist, autonomous, flexible, often rebellious, rather unreliable, with little self-control and little sense of responsibility, self-satisfied, heedless of the appearances and judgment of others [38]. In this case, we refer to characteristics not necessarily present at the same time in the same person. As can be seen from this brief review, scholars who have dealt with creativity have often taken into consideration only one variable at a time. It is necessary instead a multi-dimensional approach that take into consideration the different factors that influence the creative behavior.

AIMS OF THE STUDY

The work aims to understand how some psychological (attitudes, values, behavior, the way we see ourselves) and personal (gender, type of studies undertaken) variables are associated with creative performance. In particular, the research aims to: detect the creative attitudes of the sample of students considered; detect any differences in the creative attitudes between males and females; detect any differences in the creative attitudes between students attending different

university courses; identify which variables, among those considered, are related to a better creative expression.

RESEARCH METHODOLOGY

The research involved the online administration (through a platform created *ad hoc*) of 4 types of self-report questionnaires (3 of which contained closed answers and 1 contained open answers) aimed at investigating the variables in question. Participation in the study was voluntary and all data submitted was done so anonymously. The students were firstly informed on the research goals and each of them was invited, through email, to access the platform using a specific link and to fill in the following questionnaires: personal data sheet and interpretation of figures for Divergent Thinking, DT 3Figures, Ideational balance of behavior, Attitudes and values, How you would describe yourself (Runco Creativity Assessment Battery [39]. The data collected was then inserted into the matrix and statistically analyzed through the SPSS program.

Research Tools

The students were given a personal data sheet aimed at detecting age, gender and course of studies and 4 self-report questionnaires. These questionnaires are part of the Runco Creativity Assessment Battery (rCAB) [39], conceived as part of Southern Oregon University's Creativity Research and Programming. These questionnaires were filled out anonymously, without a time limit, through an online platform, which could be accessed using a specific link. The first test, which contained open answers, 3DT Figures consists in 3 items, made up of 3 figures and aims to detect the fluidity, flexibility and originality of the answers obtained, considered crucial in the evaluation of Divergent Thought. For such evaluation, the students were asked to observe the 3 figures and to list as many things and ideas as possible that could inspire their imagination, they were also asked not to consider this as a test but to think of it as a kind of game, a fun exercise. DT tests can be scored by examining "ideational pools," where all ideas from any one examinee are presented in their entirety to judges, for example, or they can be scored statistically and objectively using various cutoffs (e.g., only unique ideas are original). The second test, Attitudes and Values (A&V) is a 5-point Likert-scale self-report. A higher score from A&V implies that the individual possesses attitudes and values that make creative behavior very likely. Participants had to choose one of the five levels (i.e., totally disagree, mostly disagree, neutral, mostly agree, totally agree) after reading the instructions. The third test, The Runco Ideational Behavior Scale, was developed in order to measure idea generation – it is a self-report measure for individual's ability to be original, flexible and fluent in ideation – which are all aspects of divergent thinking. The authors of RIBS admit that the theoretical background of the scale is found in P. Guilford's Structure of Intellect Model [21] and specifically – in the notion that "ideas are a result of original, divergent and creative thinking processes". Furthermore, they defined creative ideation as actual behaviours which reflect "the individual's use of, appreciation of and skill with ideas". They intended RIBS as an alternative method for creativity assessment. Their main assumption was that "ideas can be considered as the products of original, divergent and even creative thinking"[40]. From this perspective creative ideas can be viewed as a characteristic which is normally distributed in population or as everyday creativity [41]. Runco proposes that the measure of ideation can be used as an adequate creativity criteria since it presupposes both idea generation, attribution of value to it and certain skills necessary for it. In order to measure ideational behavior, Runco, Plucker and Lim [40] developed a set of 100 items, and afterwards reduced it to 23 items that reflect ideational principles. The statements were assessed through the 5-point

Likert rating scale, where 1 point means – never, and 5 points – very often. This version of RIBS contained 5 subscales. Based on confirmatory factor analysis results, they stated that one or two factor solutions may be appropriate for the RIBS. They favored a one factor solution because of its theoretical fit with the construct of interest. Analyses in this study involved one overall RIBS score that could range from 23 to 115. The fourth test, which contained closed answers, included 15 items inherent to “How would you describe yourself?” and was used to evaluate the presence of certain personality traits that are frequently associated with creativity. They were asked, on a scale of 0-5 (from “never” to “always”), to evaluate themselves by choosing the most suitable answer, basing their answers on their own opinion and not on that of other people. Furthermore, they were asked to work rapidly, without pausing at every single question and without considering the contradictions in the options listed.

Description of the Sample

The total sample included 1069 students attending the University of Cassino, of which 781 females (73,6%) and 288 males (26,94%) with an overall average age of 25,076. The students belonged to the economics, law, engineering, human sciences and socio-healthcare professions degree courses as shown in the table 1 which also shows the various percentages.

Table 1. Degree course attended and gender's distribution

Degree Course	Gender	Fr.	%
Economics	Female	102	9,54
	Male	72	6,74
	Total	174	16,28
Law	Female	68	6,36
	Male	49	4,58
	Total	117	10,94
Engineering	Female	54	5,05
	Male	126	11,79
	Total	179	16,74
Health and Social care	Female	67	6,27
	Male	8	0,75
	Total	75	7,02
Human studies	Female	491	45,93
	Male	33	3,09
	Total	524	49,02

RESULTS AND DISCUSSION

Attitudes and Values

In the Attitudes and Values test our sample achieved an overall total score of 3,642 (SD=0,31) which is slightly above average; the male subjects obtained an average score of 3,654 (SD=0,37) slightly higher than that obtained by the female subjects (M=3,638; SD= 0,29).

Table 2. Attitudes and values: mean and deviance of the sample

Gender	Fr.	%	Mean	Deviance
Female	781	73,06	3,638	0,29
Male	288	26,94	3,654	0,37
Total	1069	100,00	3,642	0,31

As shown in the table 3, both the engineering and the health and social care students obtained average scores that were slightly higher than the other groups.

Table 3. Attitudes and values: mean and deviance in different degree course

Degree Course	Gender	Fr.	%	Mean	Deviance
Economics	Female	102	9,54	3,628	0,35
	Male	72	6,74	3,625	0,37
	Total	174	16,28	3,627	0,36
Law	Female	68	6,36	3,622	0,32
	Male	49	4,58	3,620	0,42
	Total	117	10,94	3,621	0,36
Engineering	Female	54	5,05	3,659	0,24
	Male	126	11,79	3,690	0,34
	Total	179	16,74	3,681	0,31
Health and Social Care	Female	67	6,27	3,637	0,26
	Male	8	0,75	3,74	0,57
	Total	75	7,02	3,648	0,30
Human sciences	Female	491	45,93	3,639	0,28
	Male	33	3,09	3,609	0,38
	Total	524	49,02	3,637	0,29

Ideational Balance of Behaviour

In this test the sample obtained an overall average score of 3,162 (SD=0,62), slightly above average. Both female and male subjects achieved the same score.

Table 4. Ideational Balance of Behaviour: mean and deviance of the sample

Gender	Fr.	%	Mean	Deviance
Female	781	73,06	3,158	0,59
Male	288	26,94	3,158	0,68
Total	1069	100,00	3,162	0,62

With regard to the division into areas (area=broad course of study), we can observe that students in the economic area obtain a higher average score than the others (M=3,247;DS=0,62), followed by those carrying out their studies in the health and social care area (M=3,231; DS= 0,63).

Table 5. Ideational Balance of Behaviour: mean and deviance in different degree course

Degree Course	Gender	Fr.	%	Mean	Deviance
Economics	Female	102	9,54	3,163	0,59
	Male	72	6,74	3,158	0,68
	Total	174	16,28	3,247	0,62
Law	Female	68	6,36	3,189	0,65
	Male	49	4,58	3,134	0,71
	Total	117	10,94	3,166	0,67
Engineering	Female	54	5,05	2,942	0,64
	Male	126	11,79	3,06	0,64
	Total	179	16,74	3,025	0,64
Health and Social Care	Female	67	6,27	3,259	0,63
	Male	8	0,75	2,993	0,7
	Total	75	7,02	3,231	0,63
Human sciences	Female	491	45,93	3,170	0,58
	Male	33	3,09	3,154	0,79
	Total	524	49,02	3,169	0,59

How Would You Describe Yourself?

In this scale the total sample obtains an average score of 3,28 (DS=0,56). The average scores achieved by both males and females are the same.

Table 6. How would you describe yourself?: mean and deviance of the sample

Gender	Fr.	%	Mean	Deviance
Female	781	73,06	3,28	0,56
Male	288	26,94	3,28	0,54
Total	1069	100,00	3,28	0,56

The following table 7 shows the scores divided by degree course. In this scale the students belonging to the health and social care areas (M=3,31; DS=0,57) and the human science area are the ones who achieved a higher average score (M=3,30; DS=0,56).

Table 7. How would you describe yourself?: mean and deviance in different degree course

Degree Course	Gender	Fr.	%	Mean	Deviance
Economics	Female	102	9,54	3,249	0,57
	Male	72	6,74	3,247	0,57
	Total	174	16,28	3,248	0,47
Law	Female	68	6,36	3,354	0,56
	Male	49	4,58	3,194	0,58
	Total	117	10,94	3,287	0,57
Engineering	Female	54	5,05	3,129	0,60
	Male	126	11,79	3,318	0,47
	Total	179	16,74	3,262	0,52
Health and Social Care	Female	67	6,27	3,330	0,55
	Male	8	0,75	3,142	0,74
	Total	75	7,02	3,31	0,57
Human sciences	Female	491	45,93	3,3	0,56
	Male	33	3,09	3,368	0,58
	Total	524	49,02	3,304	0,56

Divergent Thinking

During the test aimed at measuring divergent thinking, our test subjects obtained an average score of 13,47 (DS=7,23); the male subjects scored slightly higher (M=14,13 DS 8,22) than the females (M=13,23, DS= 6,82).

Table 8. Divergent Thinking: Mean And Deviance Of The Sample

Gender	Fr.	%	Mean	Deviance
Female	781	73,06	13,23	6,82
Male	288	26,94	14,13	8,22
Total	1069	100,00	13,47	7,23

As shown in the table below, students belonging to the engineering faculty obtain the highest average score in creative performance (M=14,8 DS= 7,22) whereas those belonging to the faculty of law obtained the lowest score (M=11,89 DS= 5,03).

Table 9. Divergent Thinking: Mean And Deviance In Different Degree Course

Degree course	Mean	Deviance
Economics	13,63	8,38
Law	11,89	5,03
Engineering	14,8	7,22
Health/Social care	13,29	6,26
Human Science	13,35	7,32
Total	13,47	7,23

In order to verify the type of relation between the variables taken into account during the research process, a correlational analysis was conducted which shows a positive correlation ($r=0,29$) between the scores obtained in the Attitudes and Values Test and the scores obtained in the How would you describe yourself Test and also a positive correlation ($r=0,34$) between the scores obtained in the Ideational balance of behavior Test and the scores obtained in the How would you describe yourself Test. There is also a positive correlation ($r=0,14$) between the scores obtained in the Divergent Thinking Test and those obtained in the test aimed at measuring Attitudes and Values Test and a slight positive correlation ($r=0,18$) between the scores obtained in the Ideational balance of behavior Test and those obtained during the Attitudes and Values Test.

DISCUSSION AND CONCLUSION

The data collected allowed the identification of some characteristics that seem more frequently associated with creative expression and the detection, in the variables considered, of some differences between the groups considered. In particular, the research work aimed to detect any differences in the attitudes, values, personality traits and creative performance of a sample group of university students, considering in particular the 'gender' variable and the type of course of study attended. As can be seen from the Attitudes and Values test, the sample as a whole has attitudes and values that make creative behavior very likely. This trend is particularly evident in males, who score slightly higher than females in this test, and in students belonging to the engineering and socio-health areas.

In the Runco Ideational Behavior Scale (RIBS), which evaluates the individual self-perception of aspects of divergent thinking such as the ability to have many original ideas and to be flexible, our sample obtained an overall average score that was slightly above the average, in this case, however, with a substantial equality between males and females. In the RIBS test, students belonging to economics and socio-health areas obtained higher scores.

The battery of tests administered also included the "How would you describe yourself? Questionnaire" that aimed at detecting the presence of personality traits found in creative individuals. They usually show a high tolerance for ambiguity, are often deeply absorbed in thoughts and hence, may appear absent-minded or even disorganized, and withdraw themselves from social events [42]. Creative individuals are also characterized by a high or even exuberant frequency of idea generation, a strong sense of self-belief and self-confidence, and ambitious determination and persistence in their creative pursuits [43]. In the subjects investigated, a slightly higher than average presence of personality traits associated with creative behavior was found and, in this respect, no significant difference was detected between males and females. On this scale, the students belonging to the health / social and humanistic areas obtained a higher average score. As for the creative performance, measured through the DT Figures test, we can observe that males obtain a higher average score than females; this is a fact that differs in part from the literature on creativity. Bear and Kaufman [44], whilst reviewing studies centered on the differences between males and females in creative performance, found that half of the research examined showed that there is no statistically significant difference between males and females in creative performance. Two-thirds of the other half of the research found that females performed better than males, while in the remaining third, males scored better. In fact, in the tests on divergent thinking, males and females score similar at any age: the differences, if any, are small. It is interesting that the difference in scores between males and females when it comes to creative

performance is not reflected in the tests that evaluate the presence of personality traits associated with creativity, nor in those that detect the presence of skills such as ideational originality, fluidity and flexibility; tests in which, to be exact, the males and females of our sample group obtained similar scores. This leads to the hypothesis that in females there is a sort of gap between creative potential and real performance. With regards to the 'course of study attended' variable we observe that engineering students obtain the highest average score in the divergent thinking test. Considering that the test in question is based on a visual stimulus, we can hypothesize that this category of students is more accustomed to mentally manipulating images and translating thoughts visually. The correlational analysis found a positive correlation between attitudes and values that predispose to creative behavior and the self-attribution of personality characteristics that are associated with creativity. Even divergent thinking, as might have been expected, is positively correlated with attitudes and values that predispose to creative action. The data discussed so far suggests some conclusive reflections. Attitudes, values, and personality traits are variables associated with creative behavior. However, in the literature on creativity, there is also substantial agreement on the fact that the potential attitude or ability to carry out a specific creative activity is realized in actuality as such only if it finds external conditions (family, cultural, social environment) and internal (motivational) that allow its expression. If we start from the widely shared assumption that gender is a social construction capable of influencing choices, expectations and behaviors of women and men, then we can reflect on the possible presence of socio-environmental and cultural factors that inhibit the full creative expression of girls of our sample who, as already pointed out, obtain worse results than boys in creative performance even if other dimensions (such as attitudes, values, personality traits and creative ideation) are similar. However, it should also be emphasized that these latter dimensions were investigated using self-report tests: the results, therefore, reflect a subjective perception and not an objective analysis of the characteristics in question. While starting from a multidimensional approach to the study of creativity, the authors of this research limit themselves to considering, in relation to creative expression, only some individual variables and not contextual ones, with the exception of the type of course of study attended. Obviously, this does not allow us to reach definitive conclusions, but only to make some preliminary observations that will have to be confirmed by further studies that take into broader consideration the individual's life context and the psychological variables that may be involved in the creative expression.

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